

Notice of Allowability

Application No.

09/819,715

Examiner

Zeev Kitov

Applicant(s)

FUKUDA ET AL.

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 11/05/03.
2. ☒ The allowed claim(s) is/are 1 - 21.
3. ☒ The drawings filed on 29 March 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: _____.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 - (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No. _____.
 - (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
 - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the margin according to 37 CFR 1.121(d).

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| 1 <input type="checkbox"/> Notice of References Cited (PTO-892) | 5 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6 <input type="checkbox"/> Interview Summary (PTO-413), Paper No. _____ |
| 3 <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No. _____ | 7 <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9 <input type="checkbox"/> Other |

REASONS FOR ALLOWANCE

Examiner acknowledges a submission of the Amendment and Arguments filed on November 5, 2003 and Supplemental Amendment filed on December 9, 2003. Claims 1, 2, 4 - 9, 13, 14 and 17 - 20 are amended. Amendment and arguments have overcome rejections under 112, 2nd paragraph, 102(b) and 103(a).

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Attorney, Mr. David Posz, on December 9, 2003.

Please amend the Application as indicated in the attached Supplemental Amendment

Reasons for Allowance

The following is an examiner's statement of reasons for allowance:

An amended independent Claim 1 discloses a semiconductor switching element driving circuit including: a semiconductor switching element having a gate terminal, a first terminal and a second terminal for carrying a main current between the first and second terminals by applying a voltage to the gate terminal; an overcurrent protection circuit for decreasing the main current at a first slope and then reducing the main current at a

second slope steeper than the first slope, when the main current exceeds a predetermined current value for a first period of time equal to or longer than a predetermined period of time; and an overcurrent limiting circuit for instantaneously dropping the voltage applied to the gate terminal when the main current becomes larger than the predetermined current value within a second period of time shorter than the predetermined period of time. The closest references for the claim are Schmidt et al. and Sasagawa et al.

Schmidt et al. disclose some of the claim elements including an overcurrent limiting circuit instantaneously dropping the voltage applied to the gate terminal of the transistor when the main current becomes equal to a second overcurrent value. Since there is no any delay element in the feedback loop of the circuit, it provides the fastest possible (instantaneous) dropping a voltage applied to the transistor gate. It further discloses a semiconductor switching element having a gate terminal, a first terminal and a second terminal carrying a main current between the first and second terminals by applying a voltage to the gate terminal. However, it does not disclose decreasing the main current at a first slope and subsequently at a second slope.

Sasagawa et al. disclose in the prior art a picture of the current falling down in two steps. However, the reference does not disclose the two steps initiated upon fulfillment of the recited above conditions. The recited limitation was not found in the collected prior art of the record. That makes Claims 1, 2, and 8 - 13 allowable. The same limitation is recited in independent Claim 17.

As per independent Claim 3, it includes, inter alia, following limitation: an overcurrent protection circuit for decreasing the main current at a first inclination when the main current becomes larger than a second comparison current that is lower than said first comparison current, and then reducing the main current at a second inclination steeper than the first inclination when the main current becomes smaller than a third comparison current that is lower than said second comparison current. The closest references for the claim are Sasagawa et al. Sasagawa et al. disclose decreasing the main current at a first inclination and then reducing the main current at a second inclination steeper than said first inclination. However, it does not disclose a condition for that change of steepness, namely that the main current becomes smaller than a third comparison current that is lower than the second comparison current. This limitation was not found in the collected prior art of the record. That makes Claims 3 – 7, 18 – 21 allowable.

A reason for Claim 14 being allowable is that the claim recites a gate electrode having a striped shape, and forming channels on both sides of the gate electrode, and having different threshold voltages on both sides of the gate electrode. Such limitation was not found in the collected prior art of the record. That makes Claims 14 and 15 allowable.

Allowability resides, at least in part, in the above-described limitations, which has not been disclosed in the Prior Art in a search.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

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accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zeev Kitov whose telephone number is (703) 305-0759. The examiner can normally be reached on 8:00 – 4:30. If attempts to reach examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (703) 308-3119. The fax phone number for organization where this application or proceedings is assigned is (703) 872-9306 for all communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Z.K.
12/05/2003



BRIAN SIRCUS
SUPERVISORY PATENT EXAMINER
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